# **ECOLOGICAL MONOGRAPHS**

OFFICIAL PUBLICATION OF THE ECOLOGICAL SOCIETY OF AMERICA

Volume 1, 1931

With 186 Figures

Published Quarterly by
The Duke University Press
Durham, N. C., U.S.A.

### TABLE OF CONTENTS

#### VOLUME I, 1931

Number 1, January	
The Rôle of the Sense Organs in Aggregations of Ameiurus melas.  Edith S. Bowen	PAGE
An Experimental Study of the Water Relations of Seedling Conifers with Special Reference to Wilting. ROBERT MARSHALL	37
NUMBER 2, APRIL	
The Vegetation of Oklahoma. W. E. Bruner	99
The Measurement of Daylight in the Chicago Area. Orlando Park	189
Number 3, July	
A Limnological Study of the Profundal Bottom Fauna of Certain Fresh-Water Lakes. Frank E. Eggleton	231
An Ecological Study of the Tobacco Beetle, Lasioderma serricorne Fabr., with Special Reference to Its Life History and Control. Thomas E. Powell, Jr	333
Number 4, September	
The Plankton Ecology of the Upper Mississippi, Minneapolis to Winona.  Edward George Reinhard	395
The Vegetation and Habitat Factors of the Coarser Sands of the North Carolina Coastal Plain: An Ecological Study. B. W. Wells and I. V. Shunk	465

#### ERRATA

Page 335, line 1: for "Fabricus" read "Fabricius."

Page 390, line 29: for "dessication" read "desiccation."

#### INDEX

Douglas Lake, 242

Dunes, 165

Aggregations, 1, 12, 22, 26, 28 Alkalinity, 422 Ameiurus, 1 melas, 3 Aristida, 468, 476, 483, 484

Bacillariophyceae, 432, 439
Behavior, 3, 5
Benthic habitat, 245
Biotic factors, 425
Botanical explorations, 128
Bottom animals, 231, 281
Bottom deposits, 246
Bowen, Edith S., article, 1
Breeding, 4, 353
Bruner, W. E., article, 99
Bullheads, 3, 22

Cannon River, 410 Carbon dioxide in soil, 505 Carbon disulphide, 376 Catfishes, 3, 22 Centrifuge, 413 Chaparral, 154 Chicago area, 189 Cigarette beetle, 333 Chippewa River, 412 Chlorides, 422 Chlorophyceae, 432, 447 Ciliophora, 432, 452 Cladocera, 432, 456 Coarse sands, 465, 491 Coastal Plain, 465 Comparison of bottom animals, 259 Conjugatae, 447 Conifers, 37, 44, 141, 130, 219, 226 Copepoda, 432, 456 Crustacea, 257, 432, 456 Culture methods, 343

Daylight, 191, 192
Deciduous forest, 130, 219, 226
Density of stands of trees, 219
Depth distribution of lake animals, 260
Distribution of Oklahoma plants, 108
Diurnal fluctuations, 60, 76, 83
Dominants, 433

Echard, 39
Ecological factors, 280, 360, 417, 421, 425
Ecological light units, 221, 224
Ecological relations, 280, 425
Edaphic factors, 496
Egg laying of beetles, 353, 357
Eggleton, Frank E., article, 231
Environment, Oklahoma, 111
Environmental resistance, 425
Equilibration, 16
Equipment, 234, 290, 294, 413, 415
Ethylene oxide, 378
Evaporation, 47, 126, 493
Evolution, 32

Factors, ecological, 280, 360, 417, 421, 425 Fertilization, 360, 417, 421, 425 Flood plain forests, 148 Food of beetles, 366 Forests, 37, 131, 148 Freshwater lakes, 231 Fumigants, 344, 374

Gastropoda, 257 Gradient tank, 6 Grasslands, 158, 468

Hardness of water, 422
Hearing, 16, 24
Heterokonteae, 432, 439
Hexapoda, 457
Hickory, 131, 142, 484, 489
Hicora, 131, 142, 484, 489
Hirudinea, 258
Humidity, 121
Humus, 497
Hydrocyanic acid gas, 374
Hydrogen-ion concentration in soil, 506
Hydrometric data, 402

Immigrant plankton, 426 Infusoria, 432, 452 Insect control, 333 Insecta, 254, 256, 457 Kirkville Green Lake, 243

Lake area, 240
Lake animals, 254
Lamellibranchiata, 258
Lasioderma serricorne Fabr., 333
Law of inconstant factors, 419
Law of minimum, 418
Life cycle, 347
Light, 15, 122, 189, 192, 417
Light, ecological significance of, 189
Light units, 221, 224
Limnology, 231
Littoral zone in lakes, 245
Longevity, 346

Marl shelf, 243
Marshall, Robert, article, 37
Mastigophora, 432, 450
Mating, 353
Meteorological data, 404
Methods, 5, 13, 43, 46, 50, 194, 209, 234, 247, 290, 338, 413
Michigan lakes, 233
Minnesota River, 409
Mississippi River, 395, 400
Physiography of, 401
Pollution zones, 409
Moisture, 39, 50
Morphometry of lakes, 238
Mud, 303

Nematoda, 257, 258 New York lakes, 233 Nitrates, 424, 505

North Carolina, 465

Myxophyceae, 432, 437

Oaks, 131, 468, 483, 488, 489
Oak-hickory association, 131
Oak-hickory, savannah, 142
Odors, 263, 369
Oklahoma, 101
Olfactory sense, 16, 22, 263, 369
Old field xerosere, 489
Oligochaeta, 255, 457
Organic matter in soil, 503
Oviposition, 353, 357
Oxygen, 421

Panicum, 485 Park, Orlando, article, 189

Pelecypoda, 258 Physical conditions and plankton, 417 Physiography of lakes, 238 Phytometer studies, 506 Phytoplankton, 432, 437 Pioneer vegetation, 469 Pinus palustris, 485 Plankton, 395, 413, 417, 421, 425, 432 Plankton organisms, 432 Plant production, 184 Pollution, 399, 409 Powell, Thomas E., Jr., article, 333 Prairie, 167, 175 Profile, 497 Profundal benthic habitat, 245 Profundal bottom fauna, 231, 253 Pyrheliometric measurements, 209

Quercus, 131, 468, 483, 488, 489

Radiant energy, 191
Radiation, 46, 192, 221
Reaction of water, 7, 234
Reinhard, Edward George, article, 395
Rhizopoda, 432, 451
Rhodophyceae, 432, 439
River levels, 417
Rotatoria, 432, 453

St. Croix River, 411 Sampling, 413 Sands, 465, 491 Sarcodina, 432, 451 Seasonal variations, 140, 147, 159, 162, 171, 178, 260, 277, 402, 407, 424, 436 Seedlings, 37, 43 Sense organs, 1, 5, 13, 16, 19, 20, 22 Sex ratios, 353 Shade and sun, 213, 215, 221 Shunk, I. V., article, 465 Silica, 424 Societies, 22, 29 Soil carbon, 503 Soil flora, 503 Soil-point measurements, 50 Soils, 115, 467, 502 Solar radiation, 192, 221 Sphaeriidae, 255 Stratification in lakes, 249, 271 Stream flow, 402

Succession, 486, 488, 491

Suctoria, 432, 453 Sun-flecks, 214

Tactile reactions, 20, 26, 27 Tardigrada, 457 Temperature, 122, 243, 337, 373, 417, 494, 496

Texture of soil, 502 Third Sister Lake, 238 Tobacco beetle, 333 Tributary plankton, 426 Turbidity, 417

Vegetation, of North Carolina, 465, 467 of Oklahoma, 99, 221

Velocity and plankton, 421 Vision, 13, 24, 31

Water in lakes, 250

Water relations, 37, 46, 52, 55, 70, 73, 82, 498

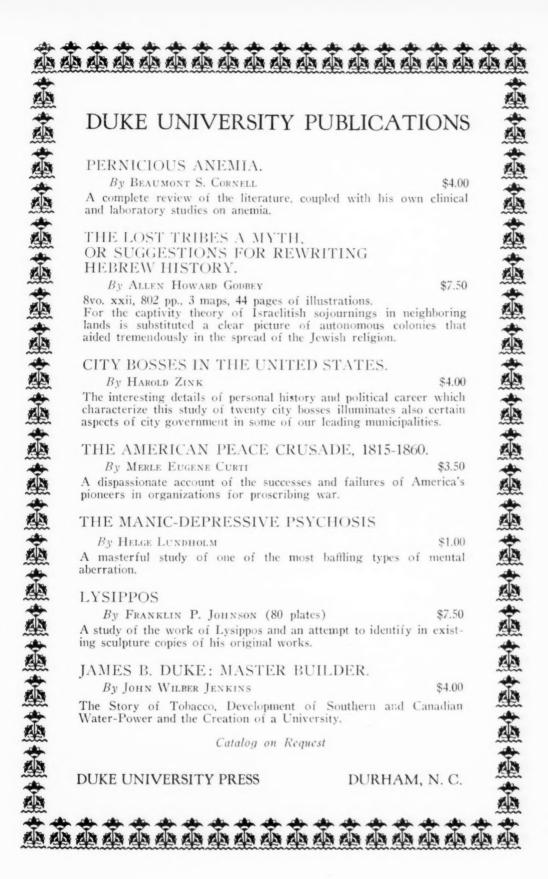
Water-supplying power of soil, 70, 78, 117, 498

Wells, B. W., article, 465 Wilting, 37, 40, 54, 67, 70, 73 Wind, 126

Zonation in lakes, 271

Zooplankton, 432, 450





# Duke University

Curricula, equipment and expense information may be obtained from

The General Catalogue

The Catalogue on Undergraduate Instruction

The Catalogue of the Graduate School

The Bulletin of the Department of Engineering

The Bulletin of the School of Medicine

The Bulletin of the School of Religion

The Bulletin of the Summer Schools

Address applications and inquiries to

R. L. Flowers, Secretary

DUKE UNIVERSITY

DURHAM, NORTH CAROLINA

# The South Atlantic Quarterly

A Magazine of Modern Opinion and Discussion. While not limited to a section, it contains many articles dealing with the South. It is now in its thirtieth year.

Subscription, \$3.00 a year.

Owing to a fire, there are no complete files of the South Atlantic Quarterly available. Several sets almost complete are still to be had. For prices, address Duke University Press, Durham, North Carolina.

# The Hispanic American Historical Review

JAMES A. ROBERTSON, J. FRED RIPPY, Editors

For the promotion of good will among the American family of nations through a better understanding of their mutual history.

Published Quarterly \$4.00 a Year

Back Files Available at \$5.00 per Volume.

DUKE UNIVERSITY PRESS DURHAM, N. C.

# AMERICAN JOURNAL OF BOTANY

OFFICIAL PUBLICATION OF THE BOTANICAL SOCIETY OF AMERICA Established 1914

Devoted to All Branches of Botanical Science
Published monthly, except during August and September
Subscription price, \$7.00 a year for complete volumes
(January-December)
Foreign Postage: 40 cents

Subscription must begin with the January number
Parts of volumes are to be had only at the single number rate
Volumes 1-17, as available, \$138 post free
Single numbers \$1.00 each, post free
Prices of odd volumes on request
Orders should be placed with

# American Journal of Botany

Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y., U. S. A.

# **ECOLOGY**

Official Publication of the Ecological Society of America

Devoted to All Forms of Life in Relation to Environment

Established 1920 Quarterly

Subscription, \$4.00 a year for complete volumes (January-December)

Foreign Postage: 20 cents

Subscription must begin with the January number
Parts of volumes are to be had only at the single number rate
Single numbers, \$1.25 post free
Back volumes, as available, \$5.00 each
Orders should be placed with

### **ECOLOGY**

Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y., U. S. A.

# **GENETICS**

A Periodical Record of Investigations Bearing on Heredity and Variation

Published Bi-Monthly by the

#### Brooklyn Botanic Garden

Subscription \$6.00 a year for complete volumes (January-December)

Single numbers, \$1.25 post free

Foreign Postage: 50 cents

Subscription must begin with the January number Parts of volumes are to be had only at the single number rate Back volumes, as available, \$7.00 each

Orders should be placed with

#### **GENETICS**

Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y., U. S. A.

Publishers: G. E. STECHERT & CO., NEW YORK—DAVID NUTT, London—FELIX ALCAN, Paris—AKAD, VERLAGS GESELLSCHAFT, Leipzig—NICOLA ZANICHELLI, Bologna—RUIZ HERMANOS, Mad--RENASCENCA PORTUGUESA, Porto-THE MARUZEN COM-PANY, Tokio.

#### INTERNATIONAL REVIEW OF SCIENTIFIC SYNTHESIS

SCIENTIA" Published every month (each number containing 100 to 120 pages)

Late Editor Eugenio Rispiano

Editors

F. Bottazzi-G. Bruni-F. Enriques

IS THE ONLY REVIEW the contributors to which are really international.

IS THE ONLY REVIEW that has a really world-wide circulation.

- IS THE ONLY REVIEW of scientific synthesis and unification that deals with the fundamental questions of all sciences: the history of the sciences, mathematics, astronomy, geology, physics, chemistry, biology, psychology and sociology.
- IS THE ONLY REVIEW therefore which, while immediately interesting students of biology and physiology, by its numerous and important articles and reports relative to these sciences, presents them also the means of knowing, in a summary and synthetic form, the chief problems of all the other branches of knowledge.

IS THE ONLY REVIEW that among its contributors can boast of the most illustrious men of science in the whole world.

The articles are published in the language of their authors, and every number has a supplement containing the French translation of all the articles that are not French. The review is thus completely accessible to those who know only French. (Write for a free copy to the General Secretary of "Scientia", Milan, sending 12 cents in stamps, merely to cover packing and postage.)

OFFICE: Via A. De Togni 12. Milano (116) SUBSCRIPTION: \$10, post free

General Secretary: Dr. PAOLO BONETTI

# THE SEEMAN PRINTERY INCORPORATED



Printing: Engraving: Lithographing
Blank Books

110-112 South Corcoran Street

Durham, N. C.

PRINTERS IN DURHAM SINCE 1885

Statement of ownership, management, circulation, etc., of Ecological Monographs, published quarterly at Durham, N. C., by the Duke University Press,

Managing Editor: A. S. Pearse. Business Manager: Ernest Seeman.

Owners: Duke University Press, Durham, N. C.

Ernest Seeman,
Business Manager.

Sworn to and subscribed before me this the 29th day of August, 1931.

C. B. Markham,

Notary Public.

My commission expires August 7, 1932.